

CLAIMS

1. A method of controlling radio resources assigned to a communication between a mobile terminal (14, 14a, 14b) and a cellular network infrastructure, the infrastructure comprising at least one radio network controller (12) and fixed transceivers (13) serving respective cells, the method comprising the steps of:
 - measuring parameters of respective propagation channels between the mobile terminal and a number of fixed transceivers;
 - transmitting to the radio network controller report messages indicating at least some of the measured parameters; and
 - processing the report messages on the radio network controller,wherein the measured parameters indicated in the report messages for at least one fixed transceiver include data representing a time variability of a power level received on the channel between the mobile terminal and said fixed transceiver.
2. The method as claimed in claim 1, wherein the variability data of a power level include an estimated variance of the time distribution of said power level.
3. The method as claimed in claim 2, wherein said variability data further comprise at least one estimation of a moment of order greater than 2 of said time distribution of the power level.
4. The method as claimed in any of the preceding claims, wherein the measured parameters indicated

in the report messages for at least one fixed transceiver further comprise an average value of the power level received on the channel between the mobile terminal and said fixed transceiver.

5 5. The method as claimed in any of claims 1 to 3,
 wherein the measured parameters indicated in the
 report messages for at least one fixed transceiver
 further comprise a signal loss value on the
10 channel between the mobile terminal and said fixed
 transceiver.

 6. The method as claimed in any of the preceding
 claims, wherein the variability data of the power
 level are measured over a first period and
 averaged over a second period, longer than the
15 first period, to be included in a report message
 transmitted to the radio network controller (12).

 7. The method as claimed in any of the preceding
 claims, wherein at least some of the propagation
 channel parameter measurements are downlink
20 measurements performed by the mobile terminal (14,
 14a, 14b) on pilot signals respectively sent by
 the fixed transceivers (13) and formed with
 defined spreading codes.

 8. The method as claimed in claim 7, wherein said
25 downlink measurements are transmitted by the
 mobile terminal (14, 14a, 14b) to the radio
 network controller (12) in report messages of a
 radio resource control protocol, relayed
 transparently by the fixed transceivers (13).

30 9. The method as claimed in any of the preceding
 claims, wherein at least some of the propagation
 channel parameter measurements are uplink
 measurements performed by the fixed transceivers

(13) on a pilot signal included in signals sent by the mobile terminal (14, 14a, 14b) on a dedicated channel.

- 5 10. The method as claimed in claim 9, wherein said uplink measurements are transmitted by the fixed transceivers (13) to the radio network controller (12) in report messages of an application protocol for controlling the fixed transceivers.
- 10 11. The method as claimed in any of the preceding claims, wherein the processing of the report messages indicating the data representing the time variability to the radio network controller (12) includes determining an active set of fixed transceivers with respect to the mobile terminal
15 (14, 14a, 14b) and activating a radio link between the mobile terminal and each fixed transceiver of the active set.
- 20 12. The method as claimed in claim 11, wherein the active set is defined according to parameters including the variability data indicated in report messages for a number of fixed transceivers and signal loss values on the respective channels between the mobile terminal and said fixed transceivers.
- 25 13. The method as claimed in any of the preceding claims, wherein the radio network controller (12) determines an active set of fixed transceivers with respect to the mobile terminal (14, 14a, 14b) and activates a respective radio link between the
30 mobile terminal and each fixed transceiver of the active set, and wherein the processing of the report messages indicating the data representing the time variability to the radio network controller includes determining a transmit power

setting control for each fixed transceiver of the active set with respect to the mobile terminal.

14. The method as claimed in claim 13, wherein the determination of the power setting control is controlled according to parameters including the variability data indicated in report messages for a number of fixed transceivers and signal loss values on the respective channels between the mobile terminal and said fixed transceivers.
15. The method as claimed in any of the preceding claims, wherein the processing of the report messages indicating the data representing the time variability to the radio network controller (12) includes determining an initial set point for a closed loop locking the transmit power of the mobile terminal, executed between a fixed transceiver and the mobile terminal, said initial set point being transmitted by the radio network controller to said fixed transceiver.
16. The method as claimed in any of the preceding claims, wherein the processing of the report messages indicating the data representing the time variability to the radio network controller (12) includes determining a mode of transmitting to the radio network controller report messages indicating at least some of the measured parameters.
17. The method as claimed in claim 16, wherein the determination of the report message transmission mode includes selecting between a periodic transmission of the report messages and an event-triggered transmission of the report messages.

18. The method as claimed in claim 17, wherein precedence is given to the periodic transmission of the report messages over the event-triggered report message transmission when the time
5 variability of the power level received on the channel between the mobile terminal and a fixed transceiver with which the mobile terminal has an active radio link is greater than a threshold.
19. The method as claimed in claim 17, wherein
10 precedence is given to the periodic transmission of the report messages over the event-triggered report message transmission when the time variability of the power level received on the channel between the mobile terminal and a fixed
15 transceiver with which the mobile terminal has an active radio link is increasing.
20. The method as claimed in any of claims 16 to 19, wherein the determination of the report message transmission mode includes, in the case of
20 periodic report message transmission, selecting the transmission interval of said messages.
21. The method as claimed in claim 20, wherein the selected transmission interval is a decreasing
25 function of the time variability of the power level received on the channel between the mobile terminal and a fixed transceiver with which the mobile terminal has an active radio link.
22. The method as claimed in any of claims 16 to 21, wherein the determination of the report message
30 transmission mode includes, in the case of an event-triggered report message transmission, selecting the event for which the detection gives rise to the transmission of one of said messages.

23. The method as claimed in claim 22, wherein the selected event has a probability of occurrence which is a decreasing function of the time variability of the power level received on the channel between the mobile terminal and a fixed transceiver with which the mobile terminal has an active radio link.
24. The method as claimed in any of claims 16 to 23, wherein the determination of the report message transmission mode also takes into account a service which involves a communication between the mobile terminal and at least one of said fixed transceivers.
25. A radio network controller for a spread spectrum cellular network infrastructure, comprising means (51-52) of communication with fixed transceivers (13) serving respective cells and with at least one mobile terminal (14, 14a, 14b), and means (15A) of controlling radio resources assigned to a communication between the mobile terminal and the cellular network infrastructure, wherein the radio resource control means comprise means for requesting, through the communication means, parameter measurement report messages for respective propagation channels between the mobile terminal and a number of fixed transceivers, and means of processing the report messages, and wherein the parameters indicated in the report messages for at least one fixed transceiver include data representing a time variability of a power level received on the channel between the mobile terminal and said fixed transceiver, taken into account by processing means.
26. The radio network controller as claimed in claim 25, wherein the variability data of a power level

include an estimated variance of the time distribution of said power level.

27. The radio network controller as claimed in claim 25 or 26, including means for determining, from a report message received for a fixed transceiver, a signal loss value on the channel between the mobile terminal and said fixed transceiver.
28. The radio network controller as claimed in any of claims 25 to 27, wherein at least some of the propagation channel parameter measurements are downlink measurements performed by the mobile terminal (14, 14a, 14b) on pilot signals respectively sent by the fixed transceivers (13) and formed with defined spreading codes.
29. The radio network controller as claimed in claim 28, wherein the communication means include means for recovering said downlink measurements in report messages of a radio resource control protocol, relayed transparently by the fixed transceivers.
30. The radio network controller as claimed in any of claims 25 to 29, wherein said report message processing means include means for determining an active set of fixed transceivers with respect to the mobile terminal (14, 14a, 14b) and means for activating a respective radio link between the mobile terminal and each fixed transceiver of the active set.
31. The radio network controller as claimed in claim 30, wherein the means for determining the active set operate according to parameters including the variability data indicated in report messages for a number of fixed transceivers and signal loss

values on the respective channels between the mobile terminal and said fixed transceivers.

- 5 32. The radio network controller as claimed in any of claims 25 to 31, including means for determining an active set of fixed transceivers with respect to the mobile terminal (14, 14a, 14b) and means for activating a respective radio link between the mobile terminal and each fixed transceiver of the active set, and wherein said processing means
10 include means of controlling the setting of the transmit power for each fixed transceiver of the active set with respect to the mobile terminal.
- 15 33. The radio network controller as claimed in claim 32, wherein the transmit power setting control means operate according to parameters including the variability data indicated in report messages for a number of fixed transceivers and signal loss values on the respective channels between the mobile terminal and said fixed transceivers.
- 20 34. The radio network controller as claimed in any of claims 25 to 33, wherein said processing means include means of determining an initial set point for a closed loop locking the transmit power of the mobile terminal, executed between a fixed
25 transceiver and the mobile terminal.
- 30 35. The radio network controller as claimed in any of claims 25 to 34, wherein said means of processing the report messages indicating the data representing the time variability include means of determining a mode of transmission to the radio network controller of report messages indicating at least some of the measured parameters.

36. The radio network controller as claimed in claim 35, wherein the means of determining the transmission mode are organized to give precedence to an event-triggered transmission mode when said data shows a time variability that is decreasing and/or less than a threshold for the power level received on the channel between the mobile terminal and a fixed transceiver with which the mobile terminal has an active radio link.
37. The radio network controller as claimed in claim 35, wherein the means of determining the transmission mode are organized to give precedence to a periodic transmission mode when said data shows a time variability that is decreasing and/or greater than a threshold for the power level received on the channel between the mobile terminal and a fixed transceiver with which the mobile terminal has an active radio link.
38. A spread spectrum mobile radiocommunication terminal, comprising:
- a radio interface (30-39) for communicating with a cellular network infrastructure comprising at least one radio network controller (12) and fixed transceivers (13) serving respective cells;
 - means (37) of measuring parameters of respective propagation channels from a number of fixed transceivers; and
 - means (40) of transmitting to the radio network controller report messages indicating at least some of the measured parameters, including, for at least one fixed transceiver, data representing a time variability of a power level received over the channel between the mobile terminal and said fixed transceiver.

39. The mobile terminal as claimed in claim 38, further comprising:

- 5 - means (40) of receiving over the radio interface, from the radio network controller, data designating an active set of fixed transceivers; and
- 10 - a diversity receiver having a number of reception fingers (38) for processing signals respectively received over a number of propagation paths each belonging to a defined propagation profile for a fixed transceiver of the active set, and means (39) of combining the signals processed by the reception fingers to determine common information conveyed by said signals.
- 15

40. The mobile terminal as claimed in claim 38 or 39, wherein the variability data of a power level include an estimated variance of the time distribution of said power level.

20 41. The mobile terminal as claimed in any of claims 38 to 40, wherein the measurement means are organized to measure the variability data of the power level over a first period and to average it over a second period, longer than the first period, for transmission to the radio network controller (12) in a report message.

25

42. The mobile terminal as claimed in any of claims 38 to 41, wherein the measurement means are organized to estimate the variability data over a period adjustable by a configuration command originating from the radio network controller (12).

30

43. The mobile terminal as claimed in any of claims 38 to 42, wherein the report messages come under a

radio resource control protocol having an instance (15B) in the mobile terminal and an instance (15A) in the radio network controller (12), and transparent for the fixed transceivers (13).

- 5 44. A base station for a spread spectrum cellular network infrastructure, comprising at least one radio transceiver (13) serving a respective cell, and means of communication (40) with at least one radio network controller (12) of the cellular network infrastructure, wherein each radio transceiver includes means (37) of measuring parameters of a propagation channel from a mobile terminal (14, 14a, 14b) in communication with the cellular network infrastructure, and wherein the means of communication with the radio network controller include means of transmitting report messages indicating at least some of the measured parameters, including data representing a time variability of a power level received on said propagation channel from the mobile terminal.
- 10
- 15
- 20
45. The base station as claimed in claim 44, wherein the means of communication with the radio network controller include means of receiving an activation command for a radio link with said mobile terminal, transmitted by the radio network controller after processing the report messages.
- 25
46. The base station as claimed in claim 44 or 45, wherein the means of communication with the radio network controller include means of receiving a control for setting the transmit power of at least one radio transceiver, transmitted by the radio network controller after processing the report messages.
- 30